

# Iowa Rivers & Waterways Study Committee

## December 10, 2013

### Des Moines, IA

- Tom Brownlow
- City Administrator
  - Charles City

# Riverfront Park

- The Cedar River is one of the most valuable assets of Charles City
- A park only for mowing
- How can we better develop the park and capitalize on the presence of the Cedar River downtown?
- We envisioned a new kind of park



























































# Immediate Impact

- “The new park has had a big positive impact on our business – absolutely.”
- “If it pulls people into town it helps us.”
- “We started out with 20 tubes and almost have 50 now because of the demand.”
- “It’s really boosted our sales” (this business reports adding workers as a result)



# Permeable Paving Projects



# Problems Waiting for a Solution

- Roads in area rated “Poor” or “Very Poor”
- Council had long wanted to improve the roads
- The storm water system was undersized or missing in some areas
- We had problems with localized ponding/flooding









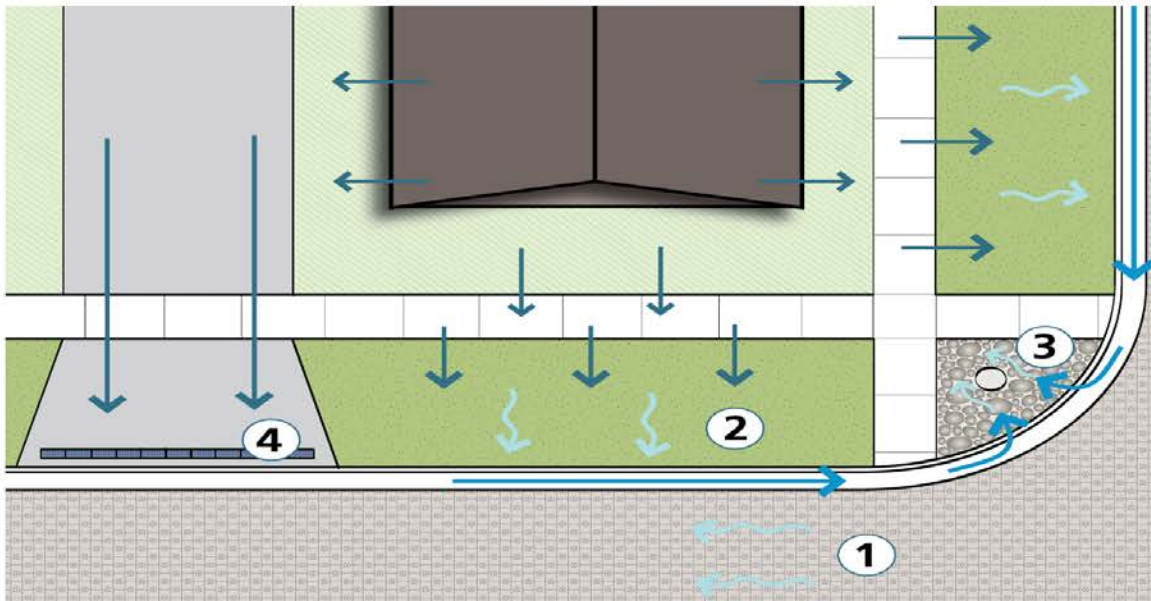




- The City elected to install a permeable paving system to address several problems simultaneously



# Components of System



Rainwater falling within the project area is collected and treated by the four rainwater system BMPs. See below for a description of each system component.

- ① Porous Unit Paving
- ② Amended Soil Infiltration Areas
- ③ Cobble Infiltration Areas
- ④ Alley Trench Grate













# Quantity of Runoff – New System

- Discharge reduced over 60% for 10-year event (4.38 inches of rainfall)
- Peak discharge reduced over 90% for 10-year event
- Runoff volumes and rates reduced over 30% for 100-year event (7.07 inches)
- System must fully infiltrate runoff from a 1.25 inch rainfall, also known as the 90% cumulative frequency event (to meet Iowa Stormwater Mgmt requirements)
- Exceeds requirements as system can fully infiltrate runoff from a 3 inch rainfall

# Water Quality Benefits

## **Porous Pavement System**

- Total Suspended Solids: 65-100% reduction
- Total Nitrogen: 65-100% reduction
- Total Phosphorus: 30-65% reduction

## **Infiltration Trench**

- Total Suspended Solids: 50-80% reduction
- Total Nitrogen: 50-80% reduction
- Total Phosphorus: 15-45% reduction



# What is water quality trading (WQT)?

- Water quality trading is an innovative approach to achieve water quality goals more efficiently.
- Trading is based on the fact that sources in a watershed can face very different costs to control the same pollutant.
- Water quality trading is a voluntary exchange of pollutant reduction credits. A facility with a higher pollutant control cost can buy a pollutant reduction credit from a facility with a lower control cost thus reducing their cost of compliance.

# Where will WQT work?

- Where watershed circumstances favor trading, it can be a powerful tool for achieving pollutant reductions faster and at lower cost.
- Trading works best when:
  - there is a "driver" that motivates facilities to seek pollutant reductions, usually a Total Maximum Daily Load (TMDL) or a more stringent water quality-based requirement in an NPDES permit;
  - sources within the watershed have significantly different costs to control the pollutant of concern;
  - the necessary levels of pollutant reduction are not so large that all sources in the watershed must reduce as much as possible to achieve the total reduction needed – in this case there may not be enough surplus reductions to sell or purchase; and
  - watershed stakeholders and the state regulatory agency are willing to try an innovative approach and engage in trading design and implementation issues.



# What are the benefits of trading?

- Trading can produce substantial cost savings while meeting the same water quality goal.
- Trading also can provide ancillary environmental benefits such as flood retention, riparian improvement and habitat.